ImPACT Internship Opportunities with Syngenta Seeds

Syngenta is a leading science-based agtech company, committed to sustainable agriculture through innovative research and technology. Innovation is the lifeblood of Syngenta and delivering innovation is the focus of scientists at Syngenta, where researchers use a combination of science and cutting-edge technology to develop innovative solutions that help farmers grow more from less. Nowhere is this more evident than at the Syngenta Innovation Center and Advanced Crop Lab at RTP. This team of 500+ leverages our state-of-the-art facility to generate insights that inform future generations of Syngenta products. Interns will experience a large and collaborative research organization working to help millions of farmers around the world to grow safe and nutritious food, while taking care of the planet. https://www.syngenta.com/en

2022 opportunities include:

1. **Protein Characterization and Analysis for Seed Product Safety**
   All Syngenta products undergo rigorous characterization and safety assessment prior to introduction. Protein characterization and analysis (PCA) is an essential part of the characterization and safety assessment for GM crops. As part of the internship, methods will be developed to enrich low-expressing proteins to a level suitable for mass spectrometry characterization and functional activity testing. The intern will curate and extract proteins from plant tissues, such as cotton, soybean, or corn plants, followed by protein quantification, preliminary enrichments, immune-purification, and state-of-the-art of HPLC techniques. Our existing experience will be used as a starting point to further enable the intern to develop strategies to optimize current purification protocols. Our proprietary tools will be made available, and the intern will be trained in the PCA team.

2. **Scientific Writer for Regulatory Affairs**
   Trait products must be approved by multiple regulatory agencies around the globe. Each agency has similar, but not identical scientific data requirements and formats for submission. We are analyzing the requirements and formats to propose and test a submission development system using standardized and approved language. The intern will work with stakeholders to complete the analysis for a subset of countries and crops, prepare standard language modules, and demonstrate the use of those modules for the development of a fit-for-purpose submission.

3. **High through-put candidate gene discovery and screening**
   Two interns in the Reproductive Biology team will support the technical component of developing breeding and technology projects. Additionally, the interns will be involved in the development of high-throughput technology for transient assays in model plant species. Historically, model systems (Arabidopsis, protoplasts, model crops) provide supporting information on genes and their effect before committing time and resources to developing and growing transgenic crops. Testing and transferring knowledge from model systems to crops through traditional breeding can be a lengthy and cumbersome process. Syngenta seeks to further develop high-throughput assays to greatly enhance the speed of both screening candidate genes and trait identification. An ideal candidate for these internship opportunities would possess fundamental molecular biology skills, experience with a model plant system, plate readers or fluorescent assays, and routine data entry and analysis.
4. Developing proxy assays to evaluate plant resistance genes
This internship is to work with laboratory scientists to establish plant bacterial system to evaluate fungal disease resistance. Specifically, the intern will help develop and establish Pseudomonas syringae or other bacteria as vectors to deliver fungal effectors and evaluate responses in crops with or without plant resistance genes. This internship will be full of industrial research characteristics- hands-on, repetitive, high-throughput, and automated if time permits. The intern will gain first-hand experience in Agri-biotech settings. Appropriate training will be provided. Some level of independent operation by the intern is expected.

5. Molecular characterization of quality traits across seed development
One of Syngenta’s areas of research interest is in the quality of the seed produced by our elite material. Understanding, predicting, and improving the quality of seed is a difficult task that requires a variety of molecular, genetic, and omics approaches. As part of the internship, the intern will analyze metabolomic, proteomic, and other omics data to identify connections between patterns in changes over time in these data and changes in endpoint seed quality traits. In particular, the intern will focus on identifying marker molecules that can predict changes in quality traits. Assays will be designed to specifically quantify these targets in support of developing high-throughput phenotyping approaches for scaled up mapping studies.

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